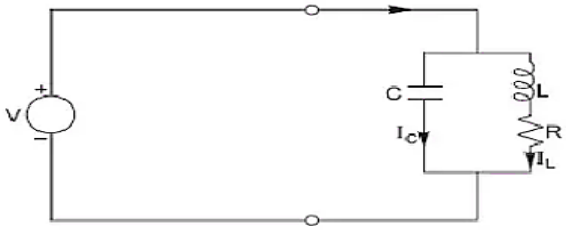
Tutoriel Work of Chapter 3 : Electrical Circuit

Exercise N°1

Consider an RLC circuit supplied by a sinusoidal source and connected in parallel.



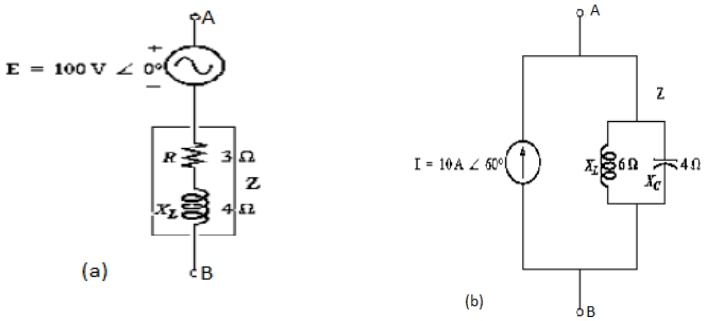
Given : R=60Ω
L=200mH
C=120μF

1- Calculate the equivalent admittance of the circuit.
2- Determine the resonant frequency

Note: Parallel resonance occurs when the supply frequency creates zero phase difference between the supply voltage and current producing a resistive circuit

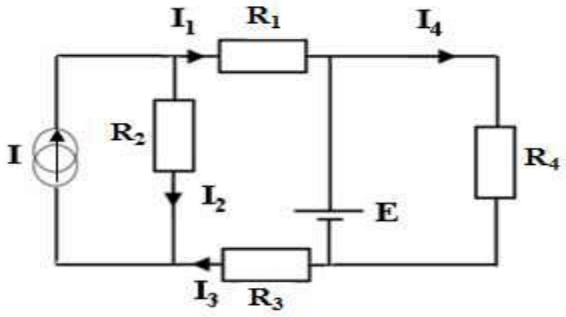
Exercise N°2

1- Convert the voltage source of Figure to a current source (fig a).
2- Convert the current source of Figure to a voltage source(fig b).



Exercise N° 3

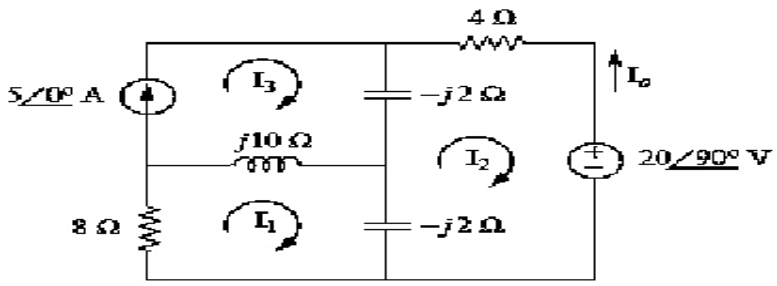
Consider the circuit shown in the figure below:



Determine the currents I_1, I_2, I_3 and I_4, using the Superposition method.

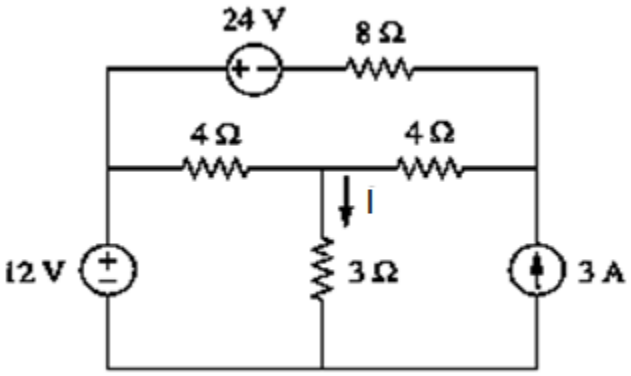
Exercise N° 4

Use the superposition theorem to find I_0 in the figure shown.



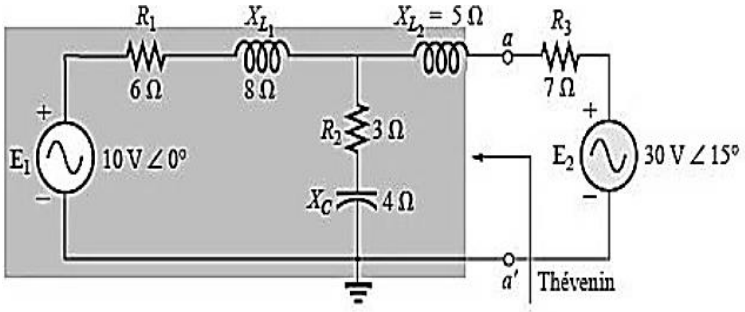
Exercise N°5

Find I in the circuit of shown figure using superposition.



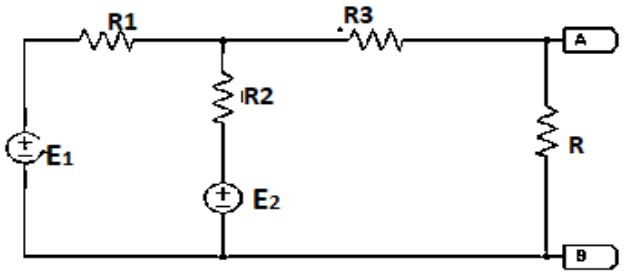
Exercise N°6

Find the Thevenin equivalent circuit for the portion of the network to the left of terminal a-a' in Figure.



Exercise N°7

Consider the following circuit:

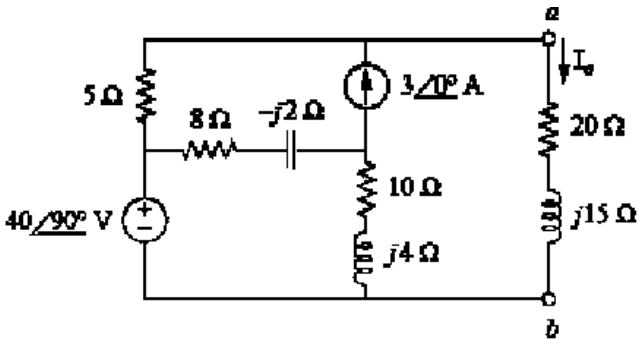


1- Find the equivalent Thevenin circuit as seen by terminals A and B
2- Calculate the value of the current flowing through resistance R and the voltage U across it.

Given: E_1=240 V, E_2=180V, R1=24Ω R2=16Ω, R3=6.4Ω and R=24Ω

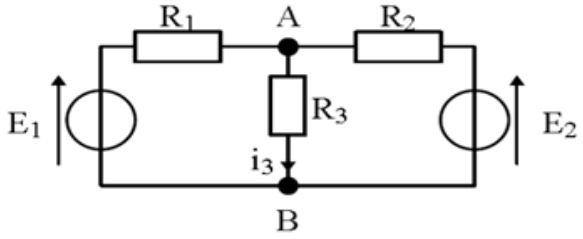
Exercise N° 8

Obtain current I_o in Figure. using Norton's theorem



Exercise N°9

Consider the following circuit:



$E_1 = 10$ V, $E_2 = 5$ V $R_1 = 15$ kΩ, $R_2 = 10$ kΩ and $R_3 = 5$ kΩ

1- Calculate the Norton equivalent Circuit of the AB dipole.
2- Deduce the value of i_3.
3- Derive the Thévenin equivalent diagram of this dipole.